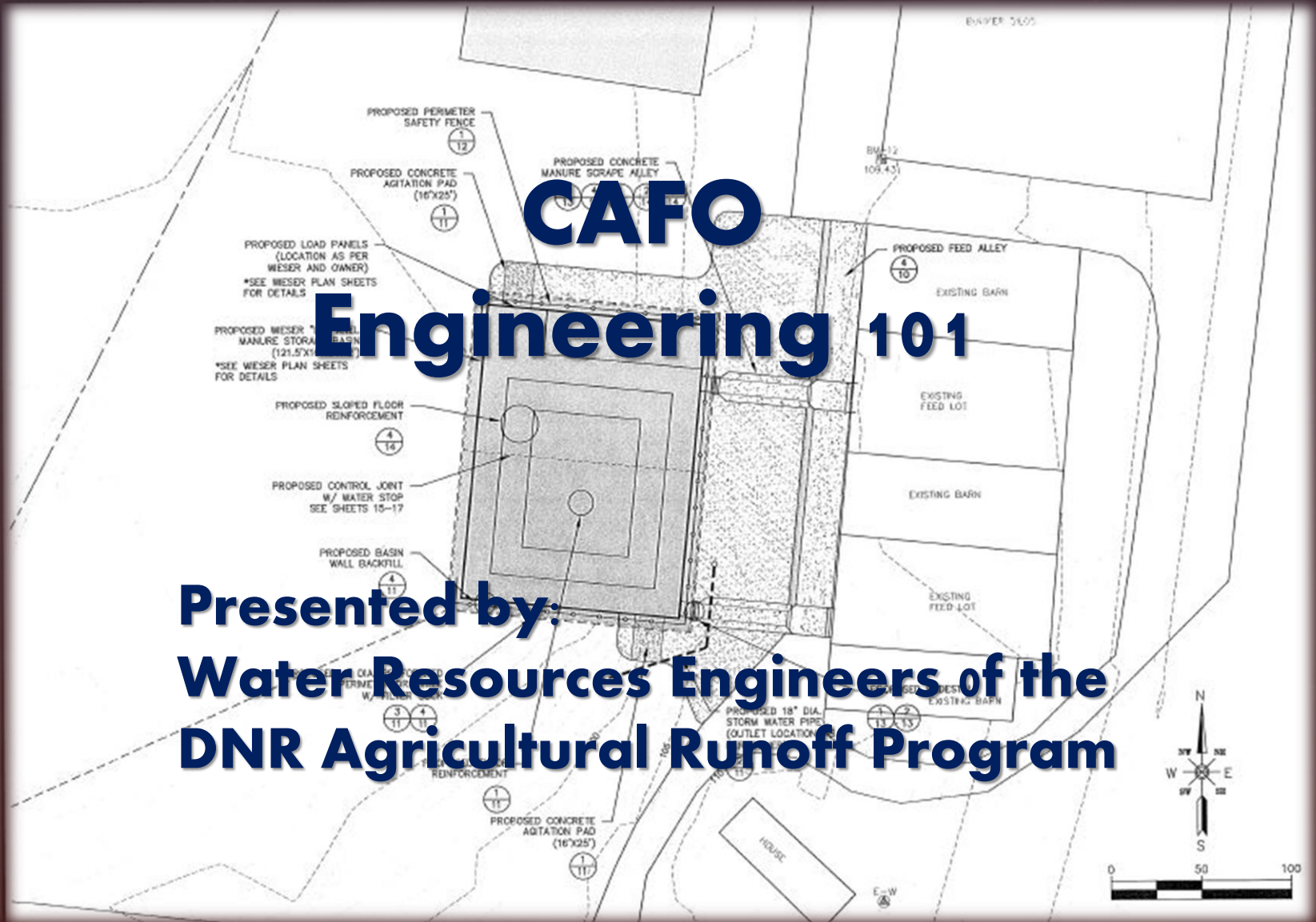


CAFO

Engineering 101

Presented by:
Water Resources Engineers of the
DNR Agricultural Runoff Program



DNR Plan & Spec Review Authority

- **Wisconsin State Statutes**
- **Wisconsin Administrative Code**

Project Types Subject to Review Under Ch. NR 243, Wis. Adm. Code

- Proposed new facilities or systems; &
- Proposed modifications to existing facilities or systems.
- Evaluations of existing facilities or systems.
- Non-ag waste addition to storage or treatment systems (digesters).
- Closure / discontinuing use of existing facilities or systems.

Typical projects

- ⌘ Manure storage (incl. digesters)
- ⌘ Feed storage, runoff controls
- ⌘ Transfer systems
- ⌘ Solids separation
- ⌘ Animal Lots



Reviewable Project Type (check all that apply):

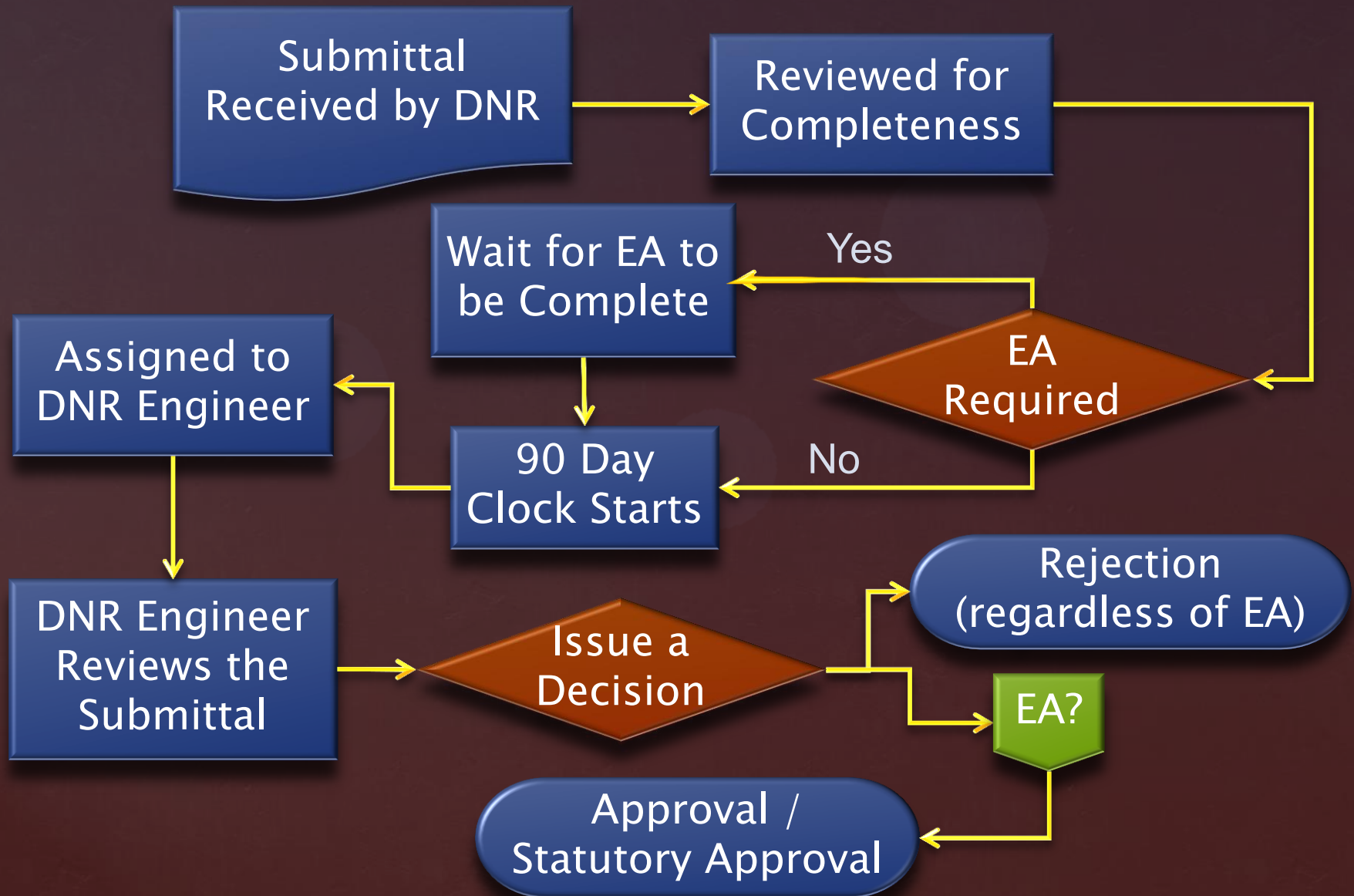
- | | |
|--|--|
| <input type="checkbox"/> Manure storage (s. NR 243.15(3) and NRCS 313) | <input type="checkbox"/> Manure Stacking (NR 243.15(8) & NRCS 313) |
| <input type="checkbox"/> Manure transfer pipe (s. NR 243.15(4) and NRCS 634) | <input type="checkbox"/> Manure Transfer Channel (NR 243.15(4) & NRCS 634) |
| <input type="checkbox"/> Reception Tank (NR 243.15(4) & NRCS 634) | <input type="checkbox"/> Detention Basin (NR 243.15(3), NRCS 313 & CPS 1001) |
| <input type="checkbox"/> Digester (NR 243.15(5) & NRCS 313, 634) | <input type="checkbox"/> Non-Ag Waste Addition for Digester (NR 243.17(1), (2) & NRCS 313) |
| <input type="checkbox"/> Composting (NR 243.15(8), 502.12 & NRCS 313) | <input type="checkbox"/> Sand Separation (NR 243.15(4) & NRCS 632, 634) |
| <input type="checkbox"/> Solids Separation (NR 243.15(4) & NRCS 632, 634) | <input type="checkbox"/> Process Wastewater (NR 213 & NRCS 313) |
| <input type="checkbox"/> Feed storage area (s. NR 243.15(9)) | <input type="checkbox"/> Runoff Controls (NR 243.15(2) & NRCS 635) |
| <input type="checkbox"/> Vegetated Treatment Area (NR 243.15(2) & NRCS 635) | <input type="checkbox"/> Irrigation Pipeline (NR 243.15(4) & NRCS 430, 634) |
| <input type="checkbox"/> Closure/Discontinuing (NR 243.17(7) & NRCS 360) | |

P&S Review Timeline

- ⌘ Can your selected designer meet your schedule? (herd expansion, compliance)
- ⌘ What information are you responsible to provide to the designer, or submit to DNR?
- ⌘ County Land Conservation Department or DATCP designer? (might be longer lead time vs. private consultant, and you may need to send submittal to DNR)



DNR P&S Review Process Overview



Construction Without Approval

- ✂ ch. NR 108 requires P&S to be rejected.
- ✂ A notice of noncompliance (NON) or notice of violation (NOV) may be given to the owner.
- ✂ An evaluation of the non-approved structures will be required. The evaluation must show that the structures were constructed to meet applicable NRCS standards and specifications.
- ✂ A structure that does not meet construction standards may be required to be removed and re-constructed, repaired, etc. before use.

P&S Completeness Review

- ⌘ The 90 day P&S review period does not start until the P&S submittal is complete.
- ⌘ An incomplete letter will be sent to the owner and consultant requesting information within 10 days from when letter is mailed.



P&S Review Criteria

- ⌘ NRCS Standards are minimum requirements
- ⌘ Site specific risks?
- ⌘ No production site pollutant discharge to navigable waters?
- ⌘ Protective of GW quality standards?
- ⌘ “Site susceptible to GW contamination”?
(based on soil type & depth to saturation/bedrock)
- ⌘ Site specific secondary containment, spill and failure prevention?

What If All P&S Review Comments Are Not Addressed?

Failure to submit the required items will delay approval & may cause the proposal to be rejected:

- ⌘ The consultant is contacted and given 1–2 weeks to provide required information.
- ⌘ If the required items aren't received by the given deadline, the P&S may be rejected.

Required P&S Submittal Items

- ⌘ Project Description*
 - ⌘ Management Assessment
 - ⌘ Site Map
 - ⌘ Site Assessment*
 - ⌘ Safety & Design Features
 - ⌘ Operation & Maintenance Plan*
 - ⌘ Construction Plan*
 - ⌘ Inspection Plan*
 - ⌘ Scaled Drawings*
 - ⌘ Storage Additional Requirements*
- * Upcoming slides lists common omissions.

Project Description

Common Omissions:

- ⌘ Purpose (new construction, modification, evaluation).
- ⌘ Design standards (ex: NRCS 313, Table 2, Col. 3).
- ⌘ Description/list critical components & features.
- ⌘ Location information

These omissions make it very difficult to understand what is proposed, & impossible to determine if approvable.

Site Assessment

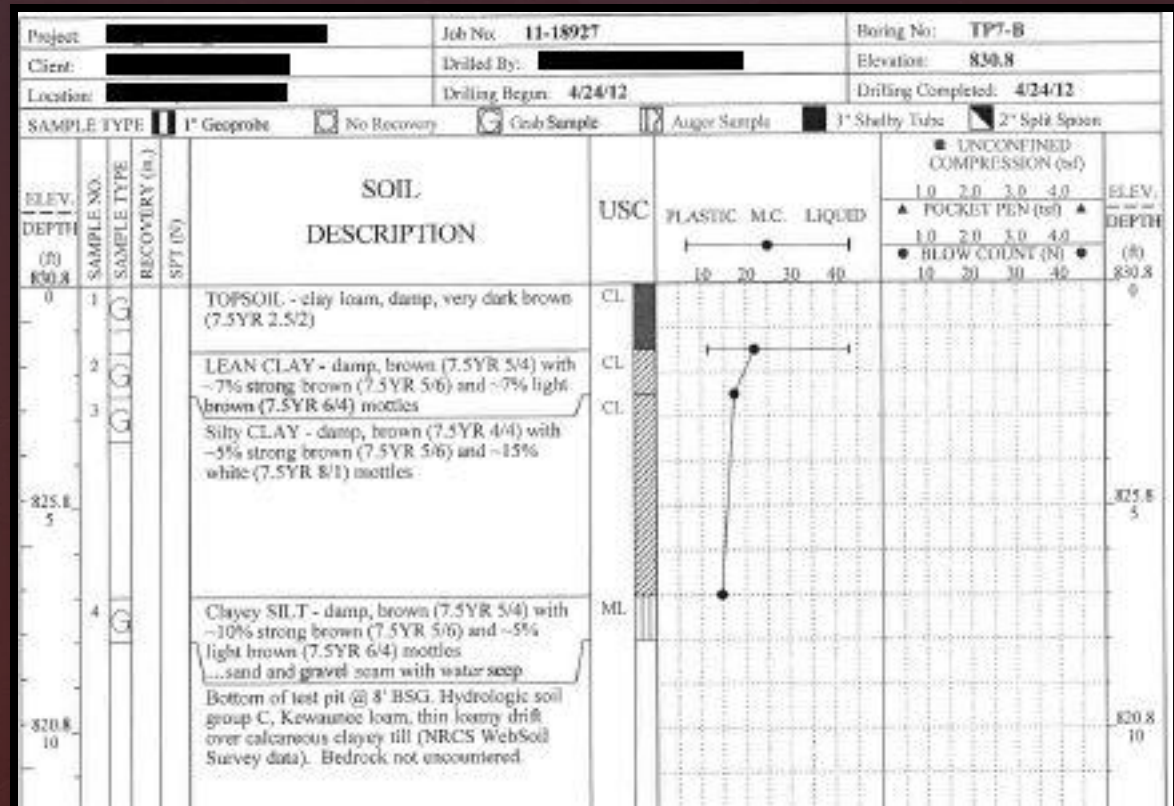
Common Omissions:

- ⌘ Saturation / bedrock elevation not stated.
- ⌘ Perched saturation not demonstrated.
- ⌘ Fluctuating / high saturation not accounted for.



Site Assessment

- ⌘ Insufficient test pits / soil borings, deep enough to demonstrate separation.
- ⌘ Logs don't include surface elevation and / or datums used.
- ⌘ No test pits / soil borings for reception tanks and transfer pipe systems.



Site Assessment

Distance to nearby features:

- ❑ Navigable waters
- ❑ Wells
- ❑ Channelized flow
- ❑ Wetlands



Manure Storage

Common Omissions:

Assessment of the impact of failure, and need for leak detection, collection and secondary containment.



Manure Storage

Common Omissions:

A detail drawing showing required level markers:

- ⌘ Margin of Safety
- ⌘ Maximum Operating Level (MOL)
- ⌘ 180 days storage (located near the bottom) or table(s) of storage volumes by depth.



Scaled Drawings

Common Omissions:

- ⌘ Site topography with surface water, concentrated flow paths, flood prone areas, sinkholes/karst features; and construction erosion control.
- ⌘ For concrete structures, locations of joints (construction, control & expansion joints. Not to be left for contractor to decide)
- ⌘ Too much detail on a single drawing.
- ⌘ Some color choices are difficult to see.
- ⌘ Incorrect detail references or incorrect titles for detail drawings.

Engineering Calculationss

Common Omissions:

- ⌘ Pipeline Hydraulic Design Calculations
- ⌘ Concrete Slab Design Calculations for Heavy Vehicle Loading.

Operation & Maintenance Plan

Common Omissions:

- ⌘ For sediment basins and other solids removal devices for contaminated runoff treatment: Frequency of cleaning and removal / replacement of media (wood chips, lime, sand).



Operation & Maintenance Plan

Common Issues:

- & Consultant should go over the O&M plan with the owner.
- & Owner needs to understand and ensure that what is being constructed is usable.



Construction Plan

Common Omissions:

- ⌘ Drawings frequently lack details or have inconsistent information.
- ⌘ Coordination meeting needed?
- ⌘ Flow of work (order of construction).
- ⌘ When multiple consultants and multiple contractors will be involved, state who is responsible for what.

Inspection Plan

Common Omissions:

- ⌘ Inspection plans are frequently not included.
- ⌘ Pressure testing of severe service pipes.
- ⌘ Identify triggers for each inspection and when they occur.
- ⌘ Who performs the inspections
and / or at a minimum identify qualifications of inspectors.



Less Stringent Requirements / Alternative Practices or Designs

If an owner demonstrates an alternative practice is as good or better than the NRCS Standard or ch. NR 243 requirement for protection of surface water and ground water, DNR may approve the alternative practice.



Post Construction Documentation

- ✓ Submit within 60 days of completing construction.
- ✓ Certify construction conforms with both:
 - s. NR 243.15, Wis. Adm. Code, &
 - NRCS Standards. (specify primary standards)
- ✓ Resident inspector certification that construction inspection conformed with the approved inspection plan.
- ✓ Documentation of inspection dates & associated construction events inspected on each date. (Copy of inspection log or summary may be sufficient.)

Post Construction Documentation

If **no** changes from approved plans:

- ⌘ Certification shall include a statement that construction fully conforms with the approved P&S.

If changes were made from the approved plans:

- ⌘ Summary of changes.
- ⌘ Certification statement shall include a statement that construction substantially conforms with the approved P&S.
- ⌘ Only revised drawing sheets or text pages is required.

Evaluations, s. NR 243.16

- ⌘ All existing facilities & systems require evaluation for new permitted operations.
- ⌘ Include all available construction documentation (borings, drawings, photos).
- ⌘ Provide assessment statement that the facility or system will meet requirements
 - Zero discharge up to the 25 yr / 24 hr rain event
 - Minimum of 180 days of storage
 - Design standards meet s. NR 243.15.
- ⌘ Some previously approved facilities may need evaluations due to age, deterioration, etc.

Questions and Final Thoughts

- ⌘ DNR engineers are not authorized to do design work.
- ⌘ Don't leave it up to the DNR reviewer to request required information – provide it up front.
- ⌘ Electronic P&S submittals are coming in the near future.
- ⌘ Use DNR staff (regional and central office) as a resource.



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